

Amendments to the Claims

This listing will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A non-asphaltic underlayment comprising:

a glass fiber-based substrate in which ~~at least one~~ a first surface thereof is directly
adhered to ~~comprises~~ a coatable laminate or a breathable thermoplastic film having a minimum
thickness of 2 mils, the breathable thermoplastic film selected from the group consisting of a
polyurethane based thermoplastic film, an ethylene-methacrylate or ethylene acrylic acid based
thermoplastic film, a mirco-porous polyolefinic thermoplastic film, a micro-porous polyester
thermoplastic film and combinations or multilayers thereof, said breathable thermoplastic film
imparts water-resistance to the underlayment ~~substrate~~ while maintaining breathability thereof,
the breathable thermoplastic film or coated laminate having a minimum moisture vapor
transmission rate of greater than about 3 perms $20 \text{ g/m}^2/\text{day}$ ~~but less than 500 g/m²/day, ; and~~

whereby at least one of the breathable thermoplastic film, coated laminate or glass fiber-
based substrate further comprising an adhesion improvement component is added to the non-
asphaltic underlayment to improve adhesion between the breathable thermoplastic film or coated
laminate and the glass fiber-based substrate.

2. (Currently Amended) The non-asphaltic underlayment of claim 1 further
comprising a skid-resistance component in the breathable thermoplastic film or coated laminate,
the skid-resistance component comprising at least one of ethyl-vinyl acetate or malefic anhydride
grafted ethyl-vinyl acetate ~~wherein the breathable thermoplastic film is located on one surface of~~
~~the substrate.~~

3. (Currently Amended) The non-asphaltic underlayment of claim 1 further comprising a second breathable thermoplastic film or coated laminate located on a second surface thereof ~~wherein the breathable thermoplastic film is located on both surfaces of the~~ substrate.

4. (Previously Amended) The non-asphaltic underlayment of claim 1 wherein the substrate is woven or non-woven.

5. (Previously Amended) The non-asphaltic underlayment of claim 4 wherein the substrate is a non-woven glass-fiber based substrate.

6. (Cancelled).

7. (Cancelled).

8. (Cancelled).

9. (Original) The non-asphaltic underlayment of claim 1 wherein the substrate has a thickness from about 5 to about 60 mils.

10. (Original) The non-asphaltic underlayment of claim 1 wherein the breathable thermoplastic film is a polyurethane based thermoplastic.

11. (Original) The non-asphaltic underlayment of claim 1 wherein the breathable thermoplastic film is an ethylene-methacrylate copolymer based thermoplastic.

12. (Currently Amended) The non-asphaltic underlayment of claim 1 wherein the breathable thermoplastic film has a thickness ~~from~~ of about 2 ~~0.5~~ to about 10 mils.

13. (Original) The non-asphaltic underlayment of claim 1 further comprising a tie layer located between the substrate and the breathable thermoplastic film.

14. (Original) The non-asphaltic underlayment of claim 13 wherein the tie layer is selected from the group consisting of a polyamide, an ethylene copolymer, wood rosin and its derivatives, a hydrocarbon resin, a polyterpene resin, atactic polypropylene and amorphous polypropylene.

15. (Original) The non-asphaltic underlayment of claim 13 wherein the tie layer is ethyl methyl acrylate (EMA) having a methyl acrylate level of about 18% or greater.

16. (Currently Amended) The non-asphaltic underlayment of claim 1 further comprising at least one of a water repellent material, an algacide, an herbicide, an antifungal material, a surface friction agent, a flame retardant, or a coloring dye.

17. (Original) The non-asphaltic underlayment of claim 1 wherein the underlayment is a base sheet of a peel and stick roofing product.

18. (Currently Amended) A non-asphaltic underlayment comprising a substantially non-water-resistant polypropylene substrate in which at least a top surface thereof is directly adhered to ~~comprises~~ a polyurethane based thermoplastic film ~~disposed thereon~~, said polyurethane based thermoplastic film imparts water-resistance to the underlayment ~~substrate~~ while maintaining breathability of the underlayment ~~substrate~~, the breathable thermoplastic film having a minimum moisture vapor transmission rate of 3 perms or greater, and
at one of the substantially non-water-resistant polypropylene or the substrate polyurethane based thermoplastic film further comprising whereby an adhesion improvement

component ~~is added to the non-asphaltic underlayment~~ to improve adhesion between the polyurethane based thermoplastic film and the substantially non-water-resistant polypropylene substrate.

19. (Withdrawn) A method of manufacturing a non-asphaltic underlayment comprising applying a breathable thermoplastic film selected from the group consisting of a polyurethane based thermoplastic film, an ethylene-methacrylate or ethylene acrylic acid based thermoplastic film, a mirco-porous polyolefinic thermoplastic film, a micro-porous polyester thermoplastic film and combinations or multilayers thereof to at least one surface layer of a substrate, said breathable thermoplastic film imparts water-resistance to the substrate while maintaining the breathability of the substrate.

20. (Withdrawn) The method of claim 19 wherein the applying includes die extrusion, air spraying, dip coating, knife coating, roll coating or a film application.

21. (Withdrawn) The method of claim 19 wherein the applying comprises lamination.

22. (Withdrawn) The method of claim 19 wherein the applying comprises chemical bonding, mechanical bonding, thermal bonding or any combination thereof.

23. (Withdrawn) A roofing system comprising a non-asphaltic, breathable underlayment and one or more shingles laid-up on an uppermost layer of the underlayment, said underlayment comprising a woven or non-woven substrate in which at least one surface thereof comprises a breathable thermoplastic film selected from the group consisting of a polyurethane based thermoplastic film, an ethylene-methacrylate or ethylene acrylic acid based thermoplastic film, a mirco-porous polyolefinic thermoplastic film, a micro-porous polyester thermoplastic

film and combinations or multilayers thereof disposed thereon, said breathable thermoplastic film imparts water-resistance to the substrate without negatively impacting breathability of the substrate.

24. (Withdrawn) A roofing system comprising a non-asphaltic, breathable underlayment and one or more shingles laid-up on an uppermost layer of the underlayment, said underlayment comprising a woven or non-woven substrate in which at least one surface thereof comprises a polyurethane based thermoplastic film, disposed thereon, said polyurethane thermoplastic film imparts water-resistance to the substrate while maintaining breathability as defined in ASTM E96 standard.

25. (Withdrawn) The roofing system of claim 24 wherein the one or more shingles include asphalt-containing single or multi-ply shingles.

26. (Withdrawn) A breathable and yet water-resistant coating selected from the group consisting of a polyurethane based thermoplastic film, an ethylene-methacrylate or ethylene acrylic acid based thermoplastic film, a micro-porous polyolefinic thermoplastic film, a micro-porous polyester thermoplastic film and combinations or multilayers thereof over a woven or a non-woven substrate.

27. (Withdrawn) The breathable and yet water-resistant coating of claim 26 wherein said underlayment forms a seal around any penetrations.

28. (Withdrawn) The breathable and yet water-resistant coating of claim 27 wherein said penetrations are the result of securing means.

29. (Withdrawn) The breathable and yet water-resistant coating of claim 28 wherein said securing means comprise nails, staples or combinations thereof.

30. (Previously Presented) The non-asphaltic underlayment of claim 1 wherein the adhesion improvement component is maleic anhydride grafted polypropylene.

31. (Previously Presented) The non-asphaltic underlayment of claim 1 wherein the adhesion improvement component is a titanate or zirconate coupling agent.

32. (Previously Presented) The non-asphaltic underlayment of claim 1 wherein the adhesion improvement component is a silane agent.

33. (Previously Presented) The non-asphaltic underlayment of claim 18 wherein the adhesion improvement component is a silane agent.

34. (New) The non-asphaltic underlayment of claim 1 wherein the adhesion improvement component comprises at least one of:

- a) Maleic anhydride grafted PP, blended up to 10%, into the breathable thermoplastic film;
- b) Titanate or Zirconate coupling agents at 5% by weight of PP into the breathable thermoplastic film; or
- c) silane treatment to glass-fiber based substrate.

35. (New) The non-asphaltic underlayment of claim 34 wherein the silane treatment is an aminoalkyltrialkoxysilanes in the presence of a salifying agent (KOH) and an emulsifier such as polyoxyethylene octylphenyl ether.

36. (New) The non-asphaltic underlayment of claim 2 wherein the skid-resistance component is a surface friction agent.